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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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|-----------------|-------------|----------------------|---------------------|------------------|

10/658,178

09/09/2003

Harry W. Sarkas

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07/31/2007

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EXAMINER

MAYEKAR, KISHOR

ART UNIT

PAPER NUMBER

1753

MAIL DATE

DELIVERY MODE

07/31/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 10/658,178 | Applicant(s) SARKAS ET AL. | |
| | Examiner Kishor Mayekar | Art Unit 1753 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>5/07</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 21 May 2007 has been entered.

Claim Rejections - 35 USC § 112

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 2-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The independent claim 2 now recites "injecting a precursor material ... through at least one of a current carrying region of an anodic column and a current carrying region of a cathodic column". The recitation with the limitation "a current

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carrying region" raises an issue of new matter because it has no support in the specification as originally filed. The specification discloses an active volume is created through introduction of an oxidizing gas into the plasma, before the plasma is expanded into a field-free zone, either (1) in a region closed proximity to a zone of charge carrier generation, or (2) in a region of current conduction between field generating elements, including the surface of the field generation elements (first full paragraph of page 6), and the active volume was created in the plasma by fluidizing the precursor with an oxidizing gas to form a heterogeneous precursor feed (Examples). The added limitation "a current carrying region" is not equated to the support "region of current conduction", and further to the "injection window" directly adjacent the cathode as made by Applicant in the remarks filed on 21 May 2007.

4. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 2, the recitation "the nanostructured material" is either lacking antecedent basis or confusing since the material has never been recited (or formed) prior to the last step.

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5. Claims 2, 3, 5 and 6 stand and new claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sayce (US 3,989,512) in view of Pirzada et al. (US 5,788,738). Sayce's invention is directed to a method of effecting the chemical or physical modification of a particulate material by a plasma heat treatment means. Sayce discloses that the method comprises the steps of generating a plasma; introducing an oxidizing gas into the plasma; injecting a precursor material into a region shown at A and B; and recovering the material after the treatment; wherein in the region A the plasma columns from the cathode and the plasma anodes merge and in the region B the region of constriction (constriction of a current-carrying arc column by magnetohydrodynamic effects) of the cathode jet (see Figs 1 and 2; Examples 1 and 2; and paragraph crossing cols. 2 and 3). Sayce also discloses that the plasma anodes merge and provide a conducting region of confluence (col. 4, lines 47-51), and that it is preferred to inject the precursor material into the plasma column at or near the origin thereof (paragraph crossing cols. 1 and 2). The difference between Sayce and the above claims is that Sayce is silent to the preparation of nanosized material. Pirzada teaches in a method of preparing nanoscale particulate material by a plasma heat treatment means and by quenching of vapors (see abstract) where the means can be a DC arc (col. 6, lines 16-21). The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified Sayce's teachings as suggested by

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Pirzada because this would result in obtaining nanoscale particulate material by combining Sayce's apparatus with Pirzada's rapid thermal quenching of high temperature vapors.

As to the subject matter of claim 5, it is inherently in the vicinity of Sayce's region 4 close to the plasma jet 3 as shown in Fig. 1.

6. Claim 4 stands and new claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sayce '512 as modified by Pirzada '738 as applied to claims 2, 3, 5, 6 and 8 above, and further in view of Applicant's admission. The difference between the references as applied above and the instant claims is the provision of introducing of the oxidizing gas into the anodic column of a transferred electric arc. However, Applicant admits in the section "Background of the Invention" that a transferred electric arc is known in addition to a free burning electric arc. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as admitted by Applicant because the substitution of art recognized equivalents would be within the level of ordinary skill in the art.

7. Claims 2, 3, 5, 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sayce '512 in view of Pirzada '738 and Sheer et al. (US 3,644,781). Sayce and Pirzada are applied as above. Sheer, a reference cited by Applicant, teaches in an arc treatment

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of a fluid, the provision of injecting the fluid to a plasma column at the origin thereof. The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the references' teachings as shown by Sheer because this would result in injecting the precursor material into the plasma column at the origin thereof.

8. Claim 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sayce '512 as modified by Pirzada '738 and Sheer '781 as applied to claims 2, 3, 5, 6 and 8 above, and further in view of Applicant's admission, for the same reasons as applied to paragraph #6 above.

Response to Arguments

9. Applicant's arguments filed 21 May 2007 have been fully considered but they are not persuasive.

To the argument that Sayce does not disclose or suggest "injecting a precursor material into the plasma through at least one of a current carrying region of an anodic column and a current carrying region of a cathodic column" and Sayce's introduction of the precursor material into the plasma region at regions A or B will not inject the precursor material into the a current carrying region of the anodic or cathodic column, since Sayce discloses in col. 5, lines 22-36 the introducing of the precursor material into the plasma

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through the region of constriction of a current-carrying arc column by magnetohydrodynamic effects, Sayce's introducing indeed inject the precursor material into the current carrying region of the cathodic column.

To the argument that Sayce teaches away from what is recited in claim 2, since Sayce as modified by Pirzada discloses a process comprises all the steps as recited, the rejection is maintained.

To the argument that the references do not disclose the limitation "the injection of the precursor material into a current carrying region of an arc column at the injection window, which is directly adjacent the cathode", since the limitation is not stated in the claim, it is irrelevant whether the references include the limitation or not. Further, the limitation is made in the combination of Sayce with Pirzada and Sheer.

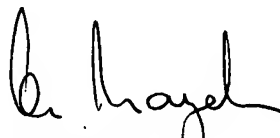
Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kishor Mayekar whose telephone number is (571) 272-1339. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Kishor Mayekar
Primary Examiner
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